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SOLIDAGO CORRELLII (ASTERACEAE: ASTEREAE), A NEW SPECIES FROM THE GUADALUPE MOUNTAIN REGION

JOHN C. SEMPLE
Department of Biology
University of Waterloo
Waterloo, Ontario Canada N2L 3G1
jcsemple@uwaterloo.ca

ABSTRACT

A new species, **Solidago correllii** Semple, is described from the Guadalupe Mountains of New Mexico and Texas. The holotype is *Correll & Johnston 19150* (LL) from McKittrick Canyon. It represents the same taxon (with a different type) earlier named as *Solidago wrightii* var. *guadalupensis* Nesom. The new species is named in honor of the late Donovan S. Correll.

Nesom (2008) described *Solidago wrightii* A. Gray var. *guadalupensis* Nesom and noted that it showed morphological affinities to *S. petiolaris* Ait. While first working on a multivariate analysis of all of *Solidago* subsect. *Thyrsiflorae* A. Gray in 2007, the author set aside several distinctive collections from the Guadalupe Mountains in Texas that might have been a new species. As the multivariate study progressed and sample sizes for taxa increased, it became obvious that these few Guadalupe Mountains collections belonged in the same taxon as those treated as Nesom's var. *gualalupensis*, but at species rank as indicated by the results of multivariate analyses (Semple et al. 2017). The higher rank is recognized here, using a different epithet and different type.

SOLIDAGO CORRELLII Semple, **sp. nov.** TYPE: **USA**. **Texas**: Culberson Co.: Guadalupe Mtns., mouth of McKittrick Canyon, along stream, flowers yellow, 2 Jul 1958, *D.S. Correll & I.M. Johnston 19150* (holotype: LL). Figures 1-2.

Solidago wrightii A. Gray var. *guadalupensis* G.L. Nesom, Phytologia 90: 29. 2008. TYPE: **USA**. **Texas**. Culberson Co.: Guadalupe Mts., south McKittrick Canyon, 27 Sep 1962, *D.S. Correll & H. Correll 26048* (holotype: LL!; isotype: SMU, not seen).

Similar to *Solidago wrightii* but the proximal stem leaves narrowly oblanceolate, petiolate and often present at flowering, shiny, sometimes silvery, glabrous except margins, and the ovary/cypselae body sparsely strigose (Fig. 3).

Plants 25–80 cm; caudices branched, thick, and woody rhizomes short (Fig. 4). **Stems** 1–5+, simple, sparsely to densely finely puberulent proximally to densely so in arrays. **Leaves:** basal and proximal winged-petiolate, blade attenuating into the petiole; blades oblanceolate, largest to 30–85 × 0.8–10.5 mm, green to silvery, shiny, glabrous, margins sparsely to moderately serrate, strigose; often present on stem at flowering, new rosettes sometimes present; cauline petiolate or sessile, blades linear-lanceolate to linear-elliptic, largest 21–60 × 3.5–13 mm, reduced distally, margins entire or with 1-2 small serrations. **Heads** 1–30, not secund, in thyrsiform-paniculiform arrays 2-20 × 1.5–13 cm, sometimes compact and nearly as wide as tall and rounded, sometimes appearing almost rounded corymbiform, proximal branches sometimes much elongate, not secund, ascending. **Peduncles** 5–2.5 mm, moderately to densely short hispid-canescent, somewhat viscid, stipitate glands minute; bracts small, linear 3-10, grading into phyllaries. **Involucres** campanulate, 3.5–6(–8) mm. **Phyllaries** in 3–4 series, unequal, linear lanceolate, acute to attenuate, sparsely to moderately viscid, especially distally, stipitate glands minute. **Ray florets** 5–13(–18); laminae ca. 3–7 × 0.5–2.2 mm, yellow. **Disc**

florets 5–25(–40); corollas 3.5–5.5 mm, lobes 0.5–1.8 mm. **Cypselae** 1.5–2.5 mm, +/- moderately short-strigose; **pappi** 3–4.6 mm. $2n = 18$.

Flowering late Jun–Sep. Open oak-pine woods and rocky limestone open ridges and slopes, gravelly stream beds; 1340–2300 m; Guadalupe Mts., N.Mex., Tex.

The species is named in honor of Donovan S. Correll, who collected many of the specimens examined and whose manual of the Texas flora with M.C. Johston (Correll & Johnston 1970) was a constant guide during the author's field work in Texas in the earlier 1970s.

Rarely a collection of *Solidago correllii* included basal rosettes (*Ward 84-028* NMC; Fig. 5). The holotype of *S. wrightii* var. *guadalupensis*, *Correll & Correll 26048* (LL), does not include basal rosettes or the lowest stem leaves; the main stem is also damaged and bears two elongated lateral branches each with an inflorescence. While the name *S. correllii* could have been based on the same holotype as *S. wrightii* var. *guadalupensis*, the new type *Correll & Johnston 19150* (LL) includes the lowest stem leaves and some persistent leaf bases (Fig. 2E) and undamaged stems. It was selected as the holotype for these features and because it was placed a posteriori into the *S. correllii* group with 100% probability in the multivariate study presented in detail in the sister paper by Semple et al. (2017). The lowest leaf is small and senescent. The persistent leaf bases also present on the small upper portion of the rootstook may be phylogenetically significant because they may indicate a relationship between *S.* subsect. *Thyrsiflorae* and *S.* sect. *Ptarmicoidei* (House) Semple & Gandhi, whose species consistently have persistent leaf bases. *Ward 84-028* (NMC) also has persistent senescent leaves, and upon first examining the collection I thought it might be a new species in sect. *Ptarmicoides* related to *S. nitidula* Torr. & A. Gray. The intuitive phylogeny of *Solidago* (Semple 2016) shows two possible origins for sect. *Ptarmicoides*, one as the basal branch in the genus and second as a basal branch off the subsect. *Thyrsiflorae* clade. Molecular data is needed to clarify whether or not either of these possibilities is likely.

Semple et al. (2001) reported a chromosome number of $2n = 18$ for *Solidago correllii* under the name *S. wrightii* (*Semple & Heard 8185*, vouchers in BRIT, MO, NMC, US, and WAT), which is corrected here.

Additional collections examined: **USA**. **New Mexico.** Eddy Co.: Guadalupe Mtns, about 48 km (by air) SE of Carlsbad at Sitting Bull Falls, reached by NM-137, canyon bottom, *R. Spellenberg & M. Spellenberg 4199* (NMC); Lincoln Natl Forest, Devils Den Canyon, S to end of rim road 540, then 2 mi SSW on Forest Trail 202, in mine tailings on NNE facing slopes, *Brunt 0009* (NMC). Lincoln Co.: *Skehan 70* (NMC). **Texas.** Culberson Co.: Guadalupe Mts. Natl Park, along Bear Canyon, *Semple & Heard 8169* (WAT); jct of Bear Canyon Trail and Bowl Trail, *Semple & Heard 8178* (WAT). Bowl Trail, *Semple & Heard 8185* (BRIT, MO, NMC, US, WAT; Fig. 6); above McKittrick Canyon, *Moore & Steyermark 3629* (LL); McKittrick Canyon, 5 mi NW of US-62/180 intersection with access road to canyon, 2.5 mi (by foot) into canyon, just W of lodge ruins, *Ward 84-028* (NMC, NY; Fig. 5); mouth of McKittrick Canyon, *Correll & Johnston 19150* (LL); N McKittrick Canyon, *Correll 13948* (LL); S McKittrick Canyon, *Warnock 10972* (LL); 2.4 km S, 1.0 km W of Pratt Lodge, ca. 1/2 km SE of Turtle Rock, *Burgess 3710* (TEX); S fork of McKittrick Canyon, *Correll & Correll 26048* (LL, SMU), *Correll & Hanson 29808* (LL). *Solidago* aff. *S. correllii*: **USA. Texas**: Jeff Davis Co., at NE tip of Bear Mountain, ca. 0.8-1.0 mi. air mi. SSW of summit of Bear Cave Mtn., *Carr, Karges, Cook, & Poole 16911* (TEX). Nesom (2008) listed additional collections under the name *S. wrightii* var. *guadalupensis*.

ACKNOWLEDGEMENTS

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in MT (Thiers, continuously updated). The following students assisted in recording location data and collecting morphological data on specimens of *Solidago subsect. Thyrsiflorae*: Andrew Lam, Yunfei Ma, Urva Naik, Naomi Steenhof, and Lan Tong. Guy Nesom is thanked for his helpful comments on several drafts of this paper.

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LUNDELL HERBARIUM
The University of Texas
AUSTIN, TEXAS
Cite: LL
HOLYTYPE: Solidago correllii Semple, in ed
Phytoneuron 2016-xxx. x. TYPE: U.S.A. TEXAS: Culberson
Co.: Guadalupe Mtns., Mouth of McKittrick Canyon, along
stream, flowers yellow, 2 Jul 1958. D.S. Correll & I.M.
Johnston 19150 (HT: LL)
John C. Semple
30 March 2016
University of Waterloo, WAT
Multivariate Studies in Solidago
Solidago subsect. Thyrsoideae
John C. Semple
WAT 2016
University of Waterloo
Solidago correllii Semple, in ed
Det. John C. Semple
2016
University of Waterloo, WAT
LUNDELL HERBARIUM
Multivariate Studies in Solidago
Solidago subsect. Thyrsoideae
J.C. Semple
WAT 2016
Specimen No
University of Waterloo
The University of Texas Herbarium (LL, TEX)
Solidago wrightii Gray
Determined by B. L. Turner, 2001
00408641
PLANTS OF TEXAS
County: Culberson
Solidago wrightii A. Gray
Along stream, mouth of McKittrick Canyon, Guadalupe Mts.; flowers yellow.
July 2, 1958
Coll: D. S. Correll & I. M. Johnston, No. 19150
Herbarium of Texas Research Foundation
Treated in 1967 with
lauryl pentachlorphenate

Figure 1. Holotype of *Solidago correllii* Semple; *Correll & Johnston 19150* (LL).

Figure 2. Details of holotype of *Solidago correllii*: stems and leaves. **A-C.** Lower, mid and upper stems. **D.** Peduncles. **E.** Lower stem leaves from base of stem. **F.** Mid stem leaf. **G.** Upper stem leaves. **H.** Upper stem leaf, adaxial surface. Scale bar = 1 mm in A-D, H; = 1 cm in E-G.

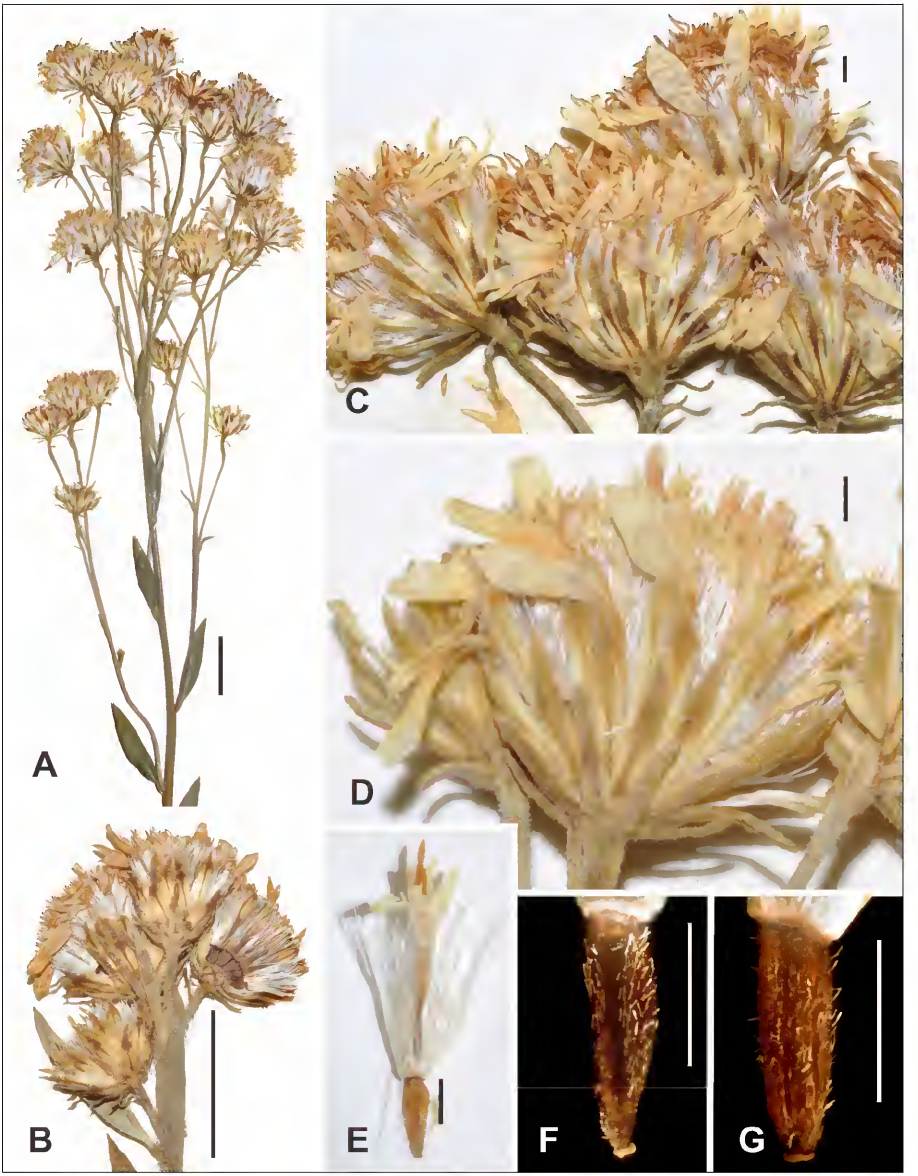

Figure 3. Details of holotype and other collections of *Solidago correllii*: heads and florets. **A.** Holotype, inflorescence. B. *Moore & Steyermark 3629* (LL), small inflorescence. **C-D.** Holotype, heads. **E.** Holotype, disc floret. **F-G.** *Correll 13948* (LL) and *Warnock 10972* (LL), ray and disc floret ovaries. Scale bar = 1 cm in A-B; = 1 mm in C-G.

Figure 4. Details of addition specimens of *Solidago correllii*: rootstook, *Moore & Steyermark 3629* (LL). Scale bars = 1 cm.

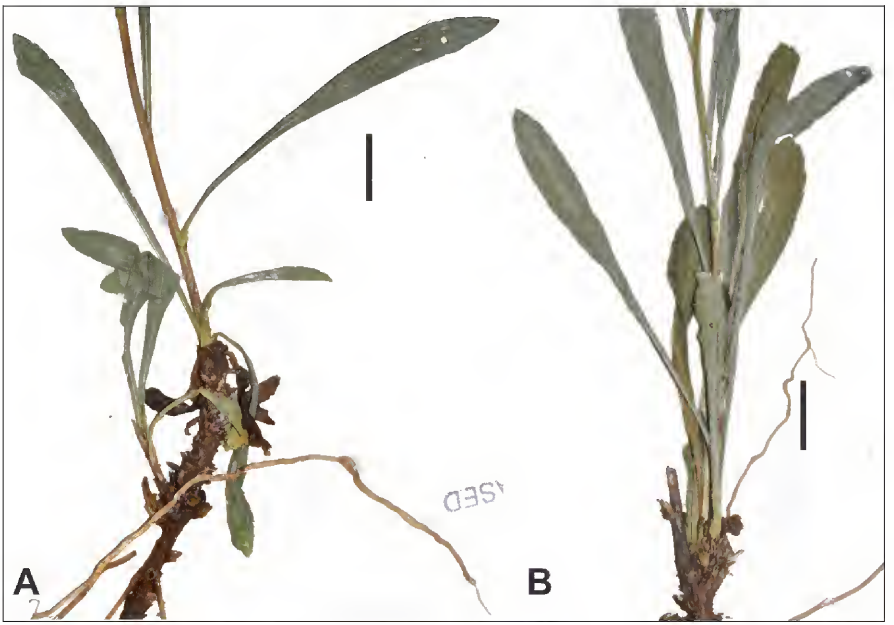

Figure 5. Details of addition specimens of *Solidago correllii*: silvery gray-green basal rosette (A) and lower stem leaves (A, B), *Ward 84-028* (NMC). Scale bars = 1 cm.

Figure 6. *Solidago correllii* in the field, Guadalupe Mts. National Park, the Bowl Trail, 7880 ft. elev., *Semple & Heard 8185.* **A.** Habitat. **B.** Flowering heads.